Claims

We claim:

1. An optical component , comprising:

a lens block optically coupled to an optical fiber;

a collimating lens coupled between the lens block and the optical fiber;

a mirror-filter block positioned with respect to the lens block so that light entering the mirror-filter block from the lens block is reflected between a flat mirror surface and a plurality of filters, the plurality of filters being coupled between the lens block and the mirror-filter block;

a plurality of focusing lenses, each of the plurality of focusing lenses optically coupled to one of the plurality of filters.

2. The component of Claim 1, wherein the collimating lens couples light between the optical fiber and the lens block.

3. The component of Claim 1, wherein the plurality of focusing lenses are integrally formed with the lens block.

4. The component of Claim 1, wherein the collimating lens is integrally formed with the lens block.

5. The component of Claim 1, wherein each of the plurality of focusing lenses focuses light received from the plurality of filters onto one of a plurality of optical detectors.

6. The component of Claim 1, wherein each of the plurality of focusing lenses focuses light from the plurality of filters onto an optical fiber.

7. The component of Claim 1, wherein each of the plurality of focusing lenses collimates light from one of a plurality of optical sources.

8. The component of Claim 1, further including a barrel portion coupled to the lens block for receiving and positioning an optical fiber with respect to the lens block.

9. The component of Claim 8, wherein the barrel portion is integrally formed with the lens block.

10. The component of Claim 8, further including a post upon which the barrel portion can be attached.

11. The component of Claim 10, wherein the post is integrally formed with the lens block.

12. The component of Claim 10, wherein the post is attachable to the lens block.

13. The component of Claim 1, wherein the collimating lens is integrally formed with the lens block.

14. The component of Claim 1, wherein the collimating lens is positioned within lens supports, the lens supports being integrally formed within the lens block.

15. The component of Claim 1, wherein the plurality of focusing lenses are integrally formed within the lens block.

16. The component of Claim 1, wherein each of the plurality of focusing lenses are such that light travels through the focusing lens substantially parallel with an optical axis of the focusing lens.

17. The component of Claim 1, wherein the lens block includes a reflecting surface to direct the light between each of the plurality of filters and one of the plurality of focusing lenses.

18. The component of Claim 1, wherein the lens block is formed by injection molding of a substantially transparent material.

19. The component of Claim 1, wherein the mirror-filter block is formed by polishing a glass block.

20. The component of Claim 1, wherein the mirror-filter block includes coating on one face.

21. The component of Claim 1, wherein the lens block, the mirror-filter block, and the filters are positioned on a base and affixed with an adhesive.

22. A method of demultiplexing a beam of light transmitted by an optical fiber, comprising:

collimating the beam of light with a collimating lens;

separating each wavelength of light from the beam of light be reflecting the beam of light between a flat mirror and a plurality of optical filters, each of the plurality of optical filters passing light in a narrow region about a specified wavelength;

propagating light passed through each of the plurality of optical filters substantially along the optical axis of one of a plurality of focusing lenses;

focusing light from each of the plurality of optical filters with one of the plurality of focusing lenses.

23. The method of Claim 22 wherein focusing light includes focusing light onto a plurality of optical detectors, each of the plurality of optical detectors positioned to receive light from one of the plurality of focusing lenses.

24. The method of Claim 22, wherein focusing light includes focusing light onto a plurality of optical fibers, each of the plurality of optical fibers positioned to receive light from one of the plurality of focusing lenses.

25. A method of multiplexing light, comprising:

receiving light from a plurality of light sources, each of the plurality of light sources transmitting an optical signal with light of a specified wavelength;

collimating the light from each of the plurality of light sources with a plurality of focusing lenses;

transmitting the light from each of the plurality of light sources into an optical filter that passes light from one of the plurality of light sources and reflects light from the remainder of the plurality of light sources;

reflecting light between the plurality of light sources and a flat reflecting surfaces so as to combine the light from each of the plurality of light sources into a single beam;

focusing the single beam onto an optical fiber with a collimating lens.

26. A method of forming an optical component comprising:

injection molding a lens block, the lens block including lens positions for a collimating lens and a plurality of focusing lenses placed such that light incident on the collimating lens and the plurality of focusing lenses is parallel with an optical axis of each of the collimating lens and the plurality of focusing lenses;

preparing a mirror-filter block, the mirror-filter block having flat surfaces, one of which is a reflecting surface;

positioning the mirror-filter block relative to the lens block;

positioning a set of filters between the lens block and the mirror-filter block;

epoxying the lens block, the mirror-filter block, and the filters to form the multiplexer/demultiplexer.